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CLAIMS

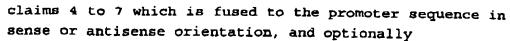
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- 1. An isolated DNA sequence from the promoter region upstream of a nectary-specific expressed sequence, which nectary-specific expressed sequence encodes a protein comprising the amino acid sequence given in SEQ ID NO:1, or a protein that has at least 60% homology to the amino acid sequence given in SEQ ID NO:1.
- 2. An isolated DNA sequence according to claim 1, wherein the nectary-specific expressed sequence has:
 - a) a nucleotide sequence given in SEQ ID NO:4, or
 - b) a nucleotide sequence which hybridises with (a) or with a fragment of (a) under the following conditions: pre-hybridisation for 1h at about 65 °C in a solution of Church and Gilbert, comprising 0.5 M sodium phosphate, pH 7.2, 1 mM EDTA, 1% BSA, 7% SDS, followed by hybridisation in the same solution for 18h at about 65 °C, followed by washing three times in 0.1 x SSC, 0.1% SDS at about 65 °C for 30 min., or
 - c) a nucleotide sequence that has at least 85% homology to the nucleotide sequence of a).
- 3. An isolated DNA sequence according to claim 1 or 2, obtained from a plant of *Petunia hybrida*, the sequence consisting essentially of the sequence given in SEQ ID NO:7, or a functional fragment thereof having promoter activity.
- 4. An isolated DNA sequence encoding a protein comprising the amino acid sequence given in SEQ ID NO:1, or a protein having at least 60% homology with the amino acid sequence given in SEQ ID NO:1, which protein, when ectopically expressed, plays a role in sugar metabolism, the expression of the DNA sequence being predominantly confined to the nectaries of a plant.
- 5. An isolated DNA sequence according to claim 4 having:
 - a) a nucleotide sequence given in SEQ ID NO:4, or

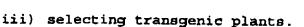
NL 009900453

- b) a nucleotide sequence that hybridises with the nucleotide sequence of (a) or with a fragment of (a) under the hybridisation conditions as defined in claim 2, or
- c) a nucleotide sequence that has at least 85% homology to the nucleotide sequence of a).
- 6. An isolated DNA sequence that results from the sequence shown in SEQ ID NO:4 by insertion, deletion or substitution of one or more nucleotides, including naturally occurring variations or variations introduced by targeted mutagenesis or recombination, wherein the DNA sequence encodes a protein exhibiting the same function as the protein according to claim 4.
- 7. An isolated DNA sequence according to claim 4 having a nucleotide sequence given in SEQ ID NO:4, said sequence being produced by current DNA synthesis techniques.
- 8. An isolated DNA sequence comprising the coding region for a signal peptide, wherein the information contained in the DNA sequence permits, upon translational fusion with a DNA sequence encoding a protein that is expressed in nectaries, targeting of the protein to nectar.
- 9. An isolated DNA sequence according to claim 8, having:
 - a) a nucleotide sequence given in SEQ ID NO:6 obtained from a plant of Calluna vulgaris, or
 - b) a nucleotide sequence that hybridises with the nucleotide sequence given in a), under the hybridisation conditions as defined in claim 2, or
 - c) a nucleotide sequence that has at least 95% homology to the nucleotide sequence of a).
- 10. A recombinant double-stranded DNA molecule comprising an expression cassette comprising the following constituents:
 - i) a promoter functional in plants,
 - ii) a DNA sequence coding for a protein as defined in any of

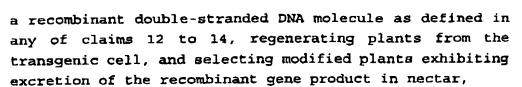
NL 009900453



- iii) a signal sequence functional in plants for the transcription determination and polyadenylation of an RNA molecule.
- 11. A recombinant double-stranded DNA molecule comprising an expression cassette comprising the following constituents:
 - i) a promoter functional in nectaries of plants,
 - ii) a DNA sequence coding for a protein which is fused to the promoter sequence in sense or antisense orientation, and optionally
 - iii) a signal sequence functional in plants for the transcription termination and polyadenylation of an RNA molecule.
- 12. A recombinant double-stranded DNA molecule comprising an expression cassette comprising the following constituents:
 - a promoter functional in nectaries of plants,
 - ii) a DNA sequence encoding a protein which is fused to the promoter,
 - iii) a DNA sequence encoding a signal peptide that targets the recombinant protein to nectar, which is translationally fused to the DNA sequence encoding the recombinant protein, and optionally
 - iv) a signal sequence functional in plants for the transcription termination and polyadenylation of an RNA molecule.
- 13. A recombinant double-stranded DNA molecule according to claim 11 or 12 wherein the promoter is as defined in any of claims 1-3.
- 14. A recombinant double-stranded DNA molecule according to claim 12 or 13 wherein the DNA sequence encoding a signal peptide is as defined in claim 8 or 9.
- 15. A process for producing a transgenic plant exhibiting excretion of a recombinant protein in its nectar, comprising:
 - i) introducing in a plant cell a recombinant double-stranded DNA-molecule as defined in any of claims 12 to 14, wherein the recombinant protein is excreted in nectar,
 - ii) regenerating plants from the transgenic cell, and



- 16. A process for producing a transgenic plant exhibiting a modified nectar composition, comprising:
 - i) introducing in a plant cell a recombinant double-stranded DNA-molecule as defined in any of claims 11 to 14, wherein the recombinant protein interferes with metabolic pathways in the nectaries,
 - ii) regenerating plants from the transgenic cell, and
 - iii) selecting transgenic plants.
- 17. A process for producing a transgenic plant exhibiting a modified nectar secretion, comprising:
 - i) introducing in a plant cell a recombinant double-stranded DNA-molecule as defined in any of claims 11 to 14, wherein the recombinant protein interferes with sink strength of nectaries,
 - ii) regenerating plants from the transgenic cell, and
 - iii) selecting transgenic plants.
- 18. A process for producing a transgenic plant exhibiting a modified nectary development, comprising:
 - introducing in a plant cell a recombinant double-stranded DNA-molecule as defined in claims 11 or 14, wherein the recombinant protein interferes with the development of nectaries,
 - ii) regenerating plants from the transgenic cell, and
 - iii) selecting transgenic plants.
- 19. A process for producing honey from modified nectar of transgenic plants, comprising:
 - i) producing a transgenic plant by introducing in a plant cell a recombinant double-stranded DNA molecule as defined in any of claims 11 to 14, regenerating plants from the transgenic cell, and selecting modified plants exhibiting the excretion of nectar with a modified composition.
 - ii) allowing insects, preferably bees, to collect nectar from the transgenic plants and to process the nectar into honey.
- 20. A process for producing a recombinant gene product from honey, comprising:
 - i) producing a transgenic plant by introducing in a plant cell



- ii) allowing insects, preferably bees, to collect nectar from the transgenic plants and to process the nectar into honey, and
- iii) isolating and purifying the gene product from the honey.
- 21. A process for producing a metabolite from honey, comprising:
 - i) producing a plant that excretes this metabolite in nectar and which plant has been produced by current breeding and selection methods,
 - ii) allowing insects, preferably bees, to collect nectar from the selected plants and to process the nectar into honey, and
 - iii) isolating and purifying the metabolite from the honey.
- 22. Micro organisms containing DNA sequences according to one or more of claims 1 to 9.
- 23. Micro organisms containing recombinant DNA molecules according to any of claims 10 to 14.
- 24. A plant cell or plant cell culture transformed with one or more DNA sequences according to claims 1 to 9.
- 25. A plant cell or plant cell culture transformed with recombinant DNA molecules according to any of 10 to 14.
- 26. A plant consisting essentially of the plant cells of claims 24 or 25.
- 27. A transgenic plant obtained by the process of any of claims 15 to 18.
- 28. Seeds, tissue culture, plant parts or progeny plants derived from a transgenic plant according to claim 27.
- 29. Honey obtained from nectar from transgenic plants, which nectar has a modified composition.

NL 009900453

30. Honey obtained from nectar from transgenic plants, which nectar comprises a recombinant gene product.